



# “Land is everything, land is us”: Exploring the connections between climate change, land, and health in Fort William First Nation

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## ABSTRACT

The myriad and cumulative impacts of climate change on land, communities, and health are increasingly evident worldwide. Throughout 2019 and 2020, Fort William First Nation and researchers at Lakehead University conducted a project to document and understand connections among climate change, land, and health from the perspective of Elders, knowledge keepers, and community members with close ties to the land. Fort William First Nation is an Anishinaabe community located on the shores of Lake Superior/*Kitchigami* in Northern Ontario and within Robinson-Superior Treaty territory. This paper describes the analysis of interviews with 22 community members. Two-Eyed Seeing, an approach that centers the working together of Indigenous and non-Indigenous knowledges and peoples and demands respectful relationship building, guided our project and analysis. Our analysis identified five themes: 1) observations and experiences of changes on the land, 2) lack of care and respect for Mother Earth as the root cause of climate change, 3) healthy land, healthy people, 4) youth and future generations, and 5) (re-)connecting with land and culture. ‘All our Relations’ is a thread woven across these themes emphasizing that climate change is understood and experienced through relationships and relationality. As concluding thoughts and reflections, we share three specific offerings of particular relevance to those engaging in climate change and health research and action with Indigenous peoples and communities. First, this research has highlighted the importance of explicitly centering land when exploring the links between climate change and health. Second, we reflect on the value of both the Two-Eyed Seeing approach and the Medicine Wheel in guiding climate change and health research. Third, we argue for an explicit focus on relationships and relationality in efforts aimed at understanding and addressing climate change.

## 1. Introduction

Climate change is a formidable threat to human health and the greatest injustice of our time (Masson-Delmotte et al., 2021; Nesmith et al., 2021). An irrefutable body of evidence has developed over the past several decades illustrating the wide-ranging impacts of climate change on health (Friel, 2019; Watts et al., 2018). Projections indicate a high likelihood of continued acute and chronic health risks via direct and indirect pathways (Clayton et al., 2017; Watts et al., 2018). Most climate and health research has focused on the direct pathways through which climate change impacts physical health endpoints grounded in a biomedical perspective (Durkalec et al., 2015; Johnson et al., 2021). However, research investigating the indirect impacts, mediated by interconnected social and ecological systems, and focusing on the

multiple and cumulative impacts on physical, mental, emotional, and spiritual health, is growing (Middleton et al., 2020a).

Most concerning are the health impacts of climate change that are disproportionately borne by marginalized people and populations who have contributed the least to rising greenhouse gas emissions, exacerbating already existing health inequities and creating new ones (Friel, 2019; Levy and Patz, 2015). Climate change has had early, severe, and disproportionate impacts on the health of Indigenous Peoples and communities worldwide because of how it has degraded homelands, and because of the ways in which colonialism, anti-Indigenous racism, and capitalism have created and perpetuated inequitable structures and systems of dispossession (Johnson et al., 2021). But despite the structural and systematic forces making Indigenous populations “vulnerable” to the impacts of climate change, Indigenous Peoples are leading

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movements for climate action and justice across the globe, and have demonstrated resilience in the face of the climate crisis (Donatuto et al., 2020; Ford et al., 2020; International Indigenous Peoples' Forum on Climate Change (IIPFCC), 2014).

Close ties with and reciprocal relationships to the land are commonly shared cultural values for Indigenous Peoples across Turtle Island (North America) and beyond (Greenwood and Lindsay, 2019). The term 'land' herein encompasses territories, terrestrial landscapes, water, air, flora, all living creatures, sustenance and healing from the land, and ancestors (Brown et al., 2012). Connectedness to land is also increasingly recognized as a central determinant of health of Indigenous Peoples in the lands we now call Canada and internationally (Greenwood et al., 2015; Kingsley et al., 2013; Lines and Jardine, 2019). Indigenous Peoples worldwide describe their relationship with the land as loving, reciprocal, interdependent, and familial (Brown et al., 2012; Ullrich, 2019), and "important to all aspects of physical, spiritual, emotional, and mental health and well-being, as it is through the land that Indigenous People have learned to live" (Mashford-Pringle and Stewart, 2019, p. 65). Because Indigenous languages and cultures have emerged from and are shaped by the land, and because Indigenous Peoples are physically and spiritually nurtured from the land, the land is also considered a source of life, culture, and identity (Robbins and Dewar, 2011; Ullrich, 2019; Wilson and Peters, 2005). Indigenous relational worldviews, which center connectedness and reciprocity with the land and natural world, nourish Indigenous People's resilience and resistance to climate change (Johnson et al., 2021).

Average annual temperatures have increased in Canada's Far North and Provincial Norths by more than 2°C since 1948; approximately three times higher than the global average (Bush and Lemmen, 2019). This significant warming has resulted in shifts in seasonality, thawing permafrost, changes in animal and plant distribution, melting sea ice, and greater frequency and intensity of extreme events. Climate change will increasingly degrade land and ecosystems, displace plant and animal kin, impact subsistence harvesting, and distort seasonal cycles and flows (Bush and Lemmen, 2019). Together, these disruptions prevent Indigenous Peoples from accessing and getting out on the land, and disorient Indigenous knowledges that have guided decision-making for generations, resulting in downstream and cumulative impacts on livelihoods, land relations, culture, and health (Bush and Lemmen, 2019; Ford et al., 2012, 2018a; Furgal and Seguin, 2006; Willox, 2013). Despite the rapidly unfolding consequences of climate change and the growing impacts on health and well-being, to date, there has been little climate change and health research with Indigenous communities within Canada's Provincial Norths, a region some refer to as the 'forgotten north' (Coates et al., 2015; Golden et al., 2015).

The research reported herein is inspired and informed by this knowledge gap, ongoing work between Fort William First Nation and Lakehead University, and calls for culturally specific, collaborative, and place-based research to build resilience to climate change in Indigenous communities (Ford et al., 2018b; Middleton et al., 2020b; Sawatzky et al., 2021). Moreover, this work is inspired by the growing calls for research that centers and foregrounds Indigenous Peoples' "relational perspectives on health and wellbeing in order to better conceptualize the health implications of climate change" (Johnson et al., 2021, p. 477). In the context of a larger project titled "Climate Change & Health in Fort William First Nation", the objective of this paper is to explore the connections among climate change, land, and health, drawing on the perspectives of Elders, knowledge keepers, and community members with close ties to the land in Fort William First Nation.

### 1.1. The larger project: Climate change and health in Fort William First Nation

In 2019, Fort William First Nation was awarded funding through the Government of Canada's Climate Change and Health Adaptation Program (CCHAP) to support the "Climate Change & Health in Fort William

First Nation" project. The CCHAP funds community-based projects that "seek to build community capacity and raise awareness around climate change and health while respecting Indigenous sovereignty ... to create tangible change within their communities, and therefore, increase awareness of climate change to reduce risks to health and well-being" (Richards et al., 2019, p. 128).

The "Climate Change & Health in Fort William First Nation" project was guided by a set of short- and long-term objectives (see Supplemental Files for the full set of project objectives). We engage with one short-term objective of this larger project within this paper: to conduct interviews with Elders, knowledge holders and others with close ties to the land to gather and share stories, Indigenous knowledge, and perspectives on climate change and health. The long-term objectives of our project highlight a commitment to ongoing respectful and reciprocal relationships.

Two-Eyed Seeing (*Etuaptmumk*) and the Medicine Wheel guided the project's development, the processes and methods employed, and our knowledge-sharing activities (Bartlett et al., 2012). Two-Eyed-Seeing, first brought forth by Mi'kmaw Elders Albert and Murdena Marshall, "... adamantly, respectfully, and passionately asks that we bring together our different ways of knowing to motivate people, Aboriginal and non-Aboriginal alike, to use all our understandings so that we can leave the world a better place and not compromise the opportunities for our youth (in the sense of Seven Generations) through our own inaction" (Bartlett et al., 2015, p. 304). Two-Eyed Seeing is an approach that can help to reconcile Western and Indigenous ways of knowing (Peltier, 2018). Applying Two-Eyed Seeing encourages the working together of Indigenous and non-Indigenous knowledges and peoples, and demands an understanding of positionality, finding common ground in meaningful ways, and relationship building (Bartlett et al., 2012). Although Two-Eyed Seeing emerged from Mi'kmaq land, culture, and language, the approach aligns with and reflects overarching concepts across diverse Nations and is increasingly used in community-based and collaborative research across Turtle Island (Roher et al., 2021). Two-Eyed Seeing has been used and described in multiple ways in the Indigenous health scholarship: as a theoretical framework, a guiding principle, an approach, and a methodology, for example (Roher et al., 2021). We used Two-Eyed Seeing as an approach orienting and guiding our work and co-learning which inspired the use of diverse methods in the overall project including learning circle workshops, the co-creation of a quilt, community interviews, a youth photovoice project, and the sharing of knowledge in diverse ways. The prioritization of visuals to complement written outputs was also central to achieve a Two-Eyed Seeing approach (Bartlett et al., 2015) as visuals and symbols are central to Ojibway peoples and history.

Our project was also inspired by the Anishinaabe Medicine Wheel and its teachings (Twigg and Hengen, 2009). We used the Medicine Wheel to orient project activities, to inform the development of our interview guide, and to emphasize our interest in understanding the links between climate change and physical, mental, emotional, and spiritual health.

## 2. Methods

### 2.1. Study setting, context, and land

This community-based project was imagined, designed, and implemented in Fort William First Nation, an Anishinaabe community in Northern Ontario. The present-day Fort William reserve, and its geographical and political boundaries, were established in 1853, created as a condition of the Robinson-Superior Treaty of 1850 (Fort William First Nation, 2021). The reserve is located at the geographical center of Turtle Island, on the outskirts of the midsize city of Thunder Bay, within the expansive boreal forest, and on the North shore of Lake Superior/Kitchigami. Fort William First Nation is also situated at the foot of Thunder Mountain/*Anemki-waucheau*, a rock formation that watches

over the land and is reminiscent of the legends of the Thunder Bird spirits that were known to roam its ancient crevices and caves (see Fig. 1) (Fort William First Nation, 2021). *Anemki-waucheau*, a sacred site for Fort William First Nation and other Indigenous Peoples, was renamed Mount McKay by settlers (Hay, 2019). This majestic place is still home to sacred ceremonies and an annual pow-wow. *Nanibijou* (present-day Sleeping Giant Provincial Park) is another rock formation that is of great significance to Fort William First Nation. *Nanibijou* holds Anishinaabe traditional legends of a giant that turned to stone because he/she whispered a secret about a silver mine that found its way to non-Indigenous people. Legends say that *Nanibijou* will awaken one day.

Fort William First Nation has treaty rights across the Robinson-Superior Treaty area which spans from the north shore of Lake Superior to the land separating the Great Lakes and Arctic watersheds (Fort William First Nation, 2019, p. 1). The traditional winter hunting and trapping grounds span northward to what is now called Wabakimi Park, to the Pigeon River in the South, and eastward towards Lake Nipigon and Batchewana Bay. In 1905, settlers expropriated 1600 acres of land and forcefully relocated the Fort William First Nation village from the shores of the Kaministiquia River to the base of *Anemki-waucheau* so that a Grand Trunk Pacific Railway grain terminus could be built on the original reserve site (Fort William First Nation, 2019). The relocation was extremely devastating to the band, and the grain terminus was never built. Despite forced relocation, Fort William First Nation remains a resilient and steadfast nation.

Today, approximately 2200 Fort William First Nation members live on and off-reserve, the community is governed by an elected Chief and Council. Health is a central focus for Fort William First Nation, as articulated in the following mission statement: “Fort William First Nation is dedicated to supporting the health of our people; inclusive of the physical, mental, emotional, and spiritual wellbeing for a successful community” (Fort William First Nation, 2021). Climate change, and the impacts of climate change on land and health, are a growing concern among First Nations across Canada. Fort William First Nation was interested in examining the connection between climate change and health, building capacity for climate adaptation, and raising awareness about climate change in the community given the dearth of climate

change projects in the community. At the time of conducting this project, and co-writing this paper, the “Climate Change & Health in Fort William First Nation” project was the only climate change-focused project underway in the Fort William First Nation.

## 2.2. Positionality statements

The co-authors of this paper are a group of three individuals with diverse backgrounds, ways of knowing and doing, and heritage; we have each brought different lived experiences to this work. One co-author Esquega, was raised in the traditional territory of Fort William First Nation and is an Indigenous woman and grandmother. When the project began, Esquega worked as an employee of the Fort William First Nation band office. The other co-authors, Galway and Jones-Casey, are white settlers, able-bodied women, mothers, and researchers with Lakehead University. Each of the co-authors has shared a fulsome positionality statement to locate ourselves, socially and physically, in relation to this work (see Supplementary Materials). In doing so, we aim to promote transparency, frame our co-learning, and enhance rigour (Bourke, 2014). Moreover, sharing aspects of ourselves and our lives with each other and the reader supports relationality and relational accountability (Wilson, 2009).

## 2.3. Knowledge holders and data collection

We refer to interview participants as *knowledge holders* to acknowledge the wisdom, stories, and knowledge held and shared by those who participated in this research. Knowledge holders were invited to participate in an interview (by co-author, community project lead, and Fort William First Nation community member, Esquega). Huntington (2000) argues that community members are best suited to identify and reach potential individuals doing research engaging a Two-Eyed Seeing approach. The community project lead has existing relationships within the community and holds a strong understanding of culture and Indigenous ways of knowing. Fort William First Nation knowledge holders were identified and invited to participate by the community project lead, aiming to gather and honour diverse perspectives from Elders,

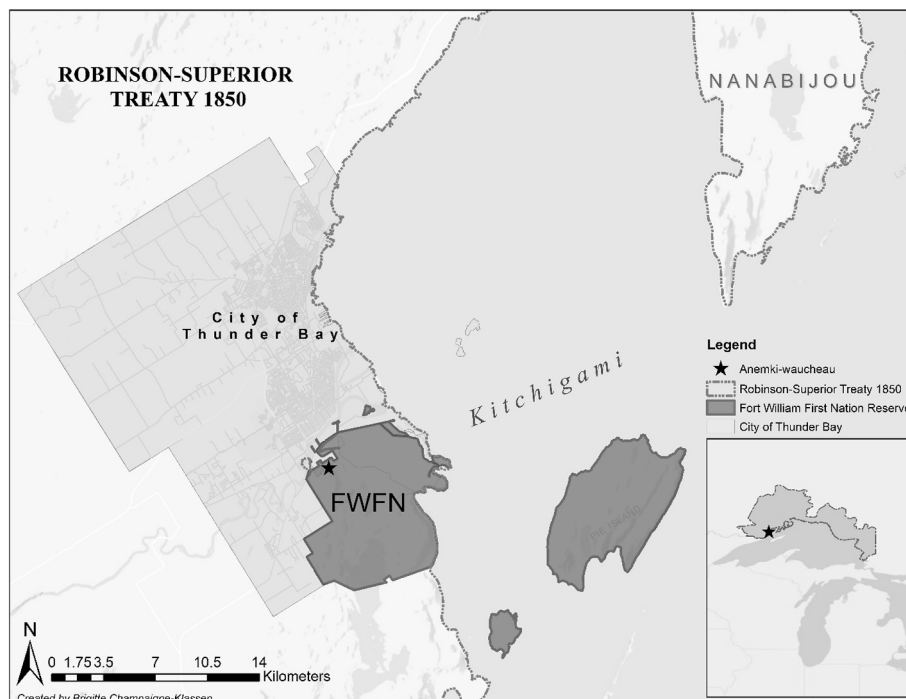


Fig. 1. Map of fort William first nation.

knowledge keepers, and community members with close relationships to the land including diversity in terms of gender, age, and self-described land relationships. A total of 22 knowledge holders participated (see Table 1 for a summary of knowledge holder characteristics). Semi-structured interviews conducted by the community project lead between November 2019 and January 2020. We chose semi-structured interviews to enable richness to emerge across knowledge keepers while also supporting the community project lead in learning of interviewing processes and practices.

The interview guide was pilot-tested with revisions made to enhance clarity as needed (see Supplemental Materials for the complete guide). Interviews were conducted conversationally to ensure that there was space for other ideas and stories to emerge. Additionally, the interviewer often asked the knowledge holders for stories, acknowledging the importance of, and centering stories and story-telling which are central to Indigenous ways of knowing. At the conclusion of each interview, knowledge holders were asked to leave a message about climate change for the youth for Fort William First Nation; specifically, we asked: “if there was a message you could leave for the children and grandchildren of Fort William First Nation about climate change, in a word or a phrase or a symbol, what would that message be?” These messages were then visualized by an artist in the community and subsequently woven together into a quilt by a second artist. This quilt was co-created as an outcome of

this project, as a gift to the community, and to also inspire a youth photovoice project (another component of the larger project; See Table in Supplemental Materials and (Galway and Esquega, 2020) for more details).

Interviews, which lasted between 30 and 70 min, were audio-recorded with permission, transcribed, and reviewed for errors. Three participants choose not to be audio-recorded; in these cases, notes and reflection were written during the interview and used in place of interview transcripts. To respect oral traditions central to Indigenous knowledge systems, consent was obtained orally. Galway and Esquega met frequently throughout the data collection process to share initial emerging trends, support co-learning, and identify the point of saturation.

This study followed Ownership, Control, Access, Possession (OCAP) principles and received approval from the Lakehead University Research Ethics Board (Schnarch, 2004). Importantly, before applying to receive funding for this project, team members presented the proposal to the Fort William First Nation Chief and Council. Support from the project was received from Chief and Council for the project (including in-kind financial support).

## 2.4. Data analysis

The data collected during interviews were analyzed by drawing on a Two-Eyed Seeing approach (Bartlett et al., 2012) and thematic network analysis (Attride-Stirling, 2001) to explore the links between climate change, land, and health from the perspective of Fort William First Nation knowledge holders. Working together to support co-learning and aiming to operationalize a Two-Eyed Seeing approach in our analysis and interpretation, the authors co-created an analytical framework. Fig. 2 provides an overview of the analysis process.

Positioning the analysis of qualitative data following LeCompte and Schensul (2010) as a process to uncover, interpret, and share stories, in the following sections we describe the stories of the links between climate change, land, and health from the perspective of Fort William First Nation community members and also position these stories in relation to existing knowledges.

## 3. Findings and discussion

We identified a total of 20 sub-themes relating to the intersection of climate change, land, and health in the data. We further organized these sub-themes into 5 organizing themes. The wholistic theme of ‘All Our Relations’ emerged from the data and is interconnected to all organizing themes and across the knowledge, stories, and experiences shared by knowledge holders. We created a visual summarizing the thematic network (see Fig. 3), following the recommendation from Bartlett et al. (2015) to use visuals when applying a Two-Eyed Seeing approach and to complement and extend the written descriptions. It is noteworthy that the circular structure of the visual purposefully illustrates the interconnectedness among the themes, while also honoring the centrality of circles in Indigenous worldviews and ways of doing. Additionally, an image of the quilt that was co-created using the messages from the knowledge holders to the youth of Fort William First Nation about climate change is included. We have included an image of the full quilt here as the messages shared also have strong links to the organizing themes presented herein (see Fig. 4). Throughout the findings section, direct quotes are used to illustrate and support findings. Rather than using numbers or alias names, we have utilized the quilt square messages to associate direct quotes with specific knowledge holders.

### 3.1. Theme 1: Observations and experiences of changes on the land

All interview participants described changes on the land that they have observed and/or experienced during their lifetime. The most commonly described changes were related to water and waterways (in

**Table 1**  
Knowledge holder characteristics.

| Elder | Self-described land relationship <sup>1</sup> | Gender | Age Category | Key messages shared about climate change (visualized in the quilt) <sup>2</sup> |
|-------|-----------------------------------------------|--------|--------------|---------------------------------------------------------------------------------|
| Yes   | Knowledge Keeper                              | M      | 60–69        | Balance                                                                         |
| Yes   | Blueberry Picker                              | F      | 50–59        | Hope                                                                            |
| Yes   | Knowledge Keeper                              | F      | 60–69        | Fix it                                                                          |
| Yes   | Knowledge Keeper                              | F      | 50–59        | Rebirth the Earth                                                               |
| Yes   | Knowledge Keeper                              | M      | 70–79        | Love                                                                            |
| No    | Knowledge Keeper                              | F      | 40–49        | Awareness                                                                       |
| Yes   | Knowledge Keeper                              | F      | 50–59        | Caring                                                                          |
| Yes   | Knowledge Keeper                              | M      | 70–79        | Hopefulness                                                                     |
| Yes   | Knowledge Keeper                              | M      | 60–69        | Prophecy                                                                        |
| Yes   | Elder                                         | F      | 60–69        | Be Strong                                                                       |
| No    | Knowledge Keeper                              | F      | 40–49        | Respect your Mother                                                             |
| No    | Steward of the Land                           | M      | 40–49        | Respect your Elders                                                             |
| No    | Steward of the Land                           | M      | 50–59        | Respect                                                                         |
| Yes   | Elder                                         | F      | 70–79        | Learn Traditional Ways                                                          |
| No    | Traditional Keeper                            | F      | 18–29        | Prosper                                                                         |
| No    | Steward of the Land                           | M      | 18–29        | Embrace your Home                                                               |
| Yes   | Protector of the Land                         | F      | 60–69        | Strive for Independence                                                         |
| No    | Peacekeeper                                   | F      | 40–49        | Heal yourself, Heal the Land                                                    |
| Yes   | Caretaker of the Land                         | F      | 70–79        | Protect Mother Earth                                                            |
| No    | Knowledge Keeper                              | M      | 50–59        | Minobibahdizewin - Plant Good Seeds                                             |
| Yes   | Elder                                         | F      | 70–79        | Take from the Land. Give back to the Land                                       |
| Yes   | Elder                                         | F      | 70–79        | Learn from your Elders                                                          |

<sup>1</sup> Self-determined and described by knowledge holders themselves as a demographic question.

<sup>2</sup> This message is used in the findings section to associate direct quotes with specific knowledge holders.



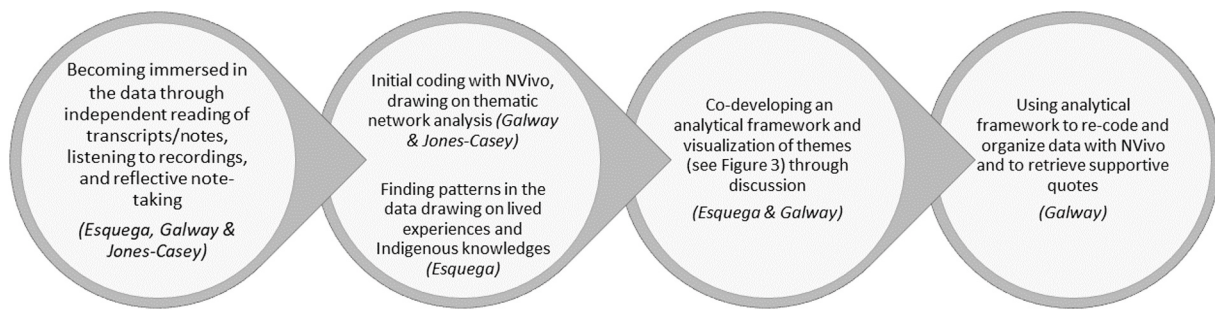


Fig. 2. Overview of data analysis process (roles of co-authors in italics).



Fig. 3. Thematic network visualization illustrating sub-themes, organizing themes, and the wholistic theme.

terms of access, quantity, and quality), flora, trees and forests, air and winds, and the distribution or well-being of wildlife. In addition to these specific changes, most knowledge holders also shared concerns about general changes in terms of seasons and seasonality while also describing that the weather has become less predictable. Table 2 provides a summary of these changes with illustrative quotes. Not surprisingly, the observed and experienced changes on the land described by knowledge holders align with the academic literature outlining climate change impacts in Canada (Bush and Lemmen, 2019).

Importantly, these observed and experienced changes were generally described in interconnected ways, rather than as separate or discrete impacts. Relatedly, the changes described concerning climate change were almost always woven together with discussions of resource extraction and other forms of land degradation and pollution. Several knowledge holders shared examples of witnessing and experiencing increasing resource extraction throughout their lifetime resulting in the degradation and destruction of land and the loss of “goodness of the land” and consequences for land relations. In other words, observations and experiences of changes on the land rarely connect to climate change alone, emphasizing the interconnectedness between climate change and other forms of land degradation. This is exemplified in the following quote:

“Ah, when I hear the word ‘climate change,’ it’s very one-sided. Climate change is not just that, it’s a whole collection of things ... I can’t say it’s just about climate, it’s about more than that.” (Knowledge holder - hopefulness)

Also noteworthy, as one knowledge holder articulated clearly in the quote below, knowledge about climate change emerges from relationships with the land, specifically, listening to, watching, learning from, and living on the land:

“And looking at that, climate change is real. Things are changing and so fast now in the weather, in the patterns and precipitation. I can’t deny what I see with my own eyes— what I see and feel with my own senses on the land.” (Knowledge holder – respect your elders)

Drawing on nearly a decade of participatory ethnoecological research with First Nations communities in British Columbia, Turner and Clifton (2009) write, “because of a complete dependence on the ability to survive out on the lands and waters in all seasons of the year, and because so much of their food and other resources are seasonal, [Indigenous peoples] are aware at any time of what to expect, and what anomalies exist” (p.183) and therefore have a deep, nuanced, and place-based understanding of the impacts of climate change on the land, seasons, and weather. Indigenous people’s observations and experiences of changes on the land are increasingly recognized as invaluable in understanding and responding to climate change (Durkalec et al., 2015; Middleton et al., 2020b; Nursey-Bray et al., 2019; Petzold et al., 2020; Sawatzky et al., 2021). This nuanced and place-based understanding of climate and environmental change impacts was evident to the co-researchers in their interviews with the knowledge holders.

### 3.2. Theme 2: Lack of care and respect as a root cause

When asked “Why do you think these changes are happening?” knowledge holders repeatedly indicated that the changes they are witnessing and experiencing on the land are due to external influences and interconnected upstream forces. Resource extraction activities and industry and the influence of money, profit, and greed were the most commonly identified factors that were coded for in our analysis. For example:

“[I]t’s good that they’re talking about the climate change because they’re finally starting to realize what’s happening. And I think that the basic thing is – it’s got to do with the people that are doing the digging and the – the scraping of the land. And ah – it’s the big companies” (Knowledge holder - fix it)

“... the companies that are just killing our world and not doing enough to maintain our world.” (Knowledge holder - awareness)

The legacy and ongoing effects of colonialism, in particular structures of oppression such as the Indian Act, the residential school system, forced relocation, and land dispossession and the violent disruption of relational ways, were also described as a cause of climate change.



**Fig. 4.** Quilt co-created as part of the project; each quilt square represents a message about climate change that the knowledge holders wanted to share with the community (with youth in particular).

**Table 2**

Summary of observed and experienced changes on the land (presented by coded sub-themes and in order of the most commonly discussed changes).

| Sub-theme                            | Illustrative quote                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water                                | "... some people talk about the fish in Lake Superior, that you know, because of the different levels and the warming, I guess of the lake, and everything, it affects everything. It affects all of the ecosystems." (Knowledge holder - protect Mother Earth)                                                                               |
| Flora, trees and forests             | "I think it's important because you look on that reserve and half of those trees are dead and – the – it's the climate that's killing everything" (Knowledge holder - rebirth the Earth)                                                                                                                                                      |
| Wildlife & food                      | "[M]y grandpa used to go and hunt for what we ate and now –there's no food to even go and hunt for. It's gone, they're ruining the land and they don't even realize that they're doing it" (Knowledge holder - hope)                                                                                                                          |
| Air and winds                        | "Ah, the winds ah – have become greater and stronger. The lake is still protecting us, but even ah, she has gone 7 and 8-foot waves." (Knowledge holder - strive for Independence)                                                                                                                                                            |
| Seasons                              | "We have a lot of changes in the seasons ... We don't know when it's going to snow. We don't know when it's going to turn spring. We have ah – a longer time to get to spring." (Knowledge holder - caring)                                                                                                                                   |
| Unpredictability of weather/extremes | "... the weather has changed a lot, it's become more – ah – turbulent ... as Indian people see it, it's been polluted and the Mother Earth is really struggling to restructure itself and clean herself and um, that's one of the reasons why there's big fires and all of these different kinds of things." (Knowledge holder - hopefulness) |

Several knowledge holders explained that colonization has resulted in a loss of connection to identity, culture, and land, ultimately leading to a loss of respect and care for the land (on the part of both Fort William First Nation members and settler peoples):

"The history mainly, of not learning all about the land, all about our culture, about our teachings, about our – um, language and all of that. Even though my parents spoke fluently, Ojibwa ... because of residential school and the history of that, well, we lost that connection to the land. We lost that connection to our culture, to our language, and everything like that." (Knowledge holder - prosper)

The climate change literature is beginning to recognize the role that colonialism has played in creating and fueling climate change and its impacts (Stein, 2019). As Davis and Todd (2017) argue, pointing to and naming colonialism as responsible for climate change and related environmental crises is long overdue. Whyte (2017) appropriately names climate change as an intensification of colonialism. Moreover, research has shown that "climate change compounds emotions tied to historical and ongoing disempowerment" including colonialism (Middleton et al., 2020b, p. 10). Therefore, any efforts aimed at responding to climate change, in Fort William First Nation and beyond, should not be divorced from the historical and ongoing effects of colonialism, the structured dispossession of Indigenous Peoples and lands or the ongoing impacts on relational ways of knowing and doing (Coulthard, 2014; Veland et al., 2013; Whyte, 2017).

Underlying and connecting these forces is a lack of care and respect for Mother Earth, identified by knowledge holders as the central and underlying cause of climate change and other forms of land degradation. As one Elder simply stated, "These changes are happening because of



disrespect for Mother Earth.” Another knowledge holder discussed lack of care and respect for Mother Earth in the following way:

*“There’s a lot of disrespect for the plants and the trees and all these things and this is one of the reasons why we’re in the um – situation where we have, what we call, climate change.”* (Knowledge holder - hopefulness)

### 3.3. Theme 3: Healthy lands, healthy peoples

This theme describes the pathways through which knowledge holders spoke to the physical, mental, emotional, and spiritual health implications of climate change. As with the ‘Observations and experiences on the land’ theme described above, knowledge holders described the pathways linking climate change, land, and health together with resource extraction and pollution. This emphasizes the interconnected and complex ways in which climatic and other forms of land degradation influence the health of Fort William First Nation peoples.

When specifically asked ‘How do you think these changes impact your health and the health of our community?’ and ‘How do you think climate change will impact the health of our children and grandchildren?’ a central idea that emerged is that when the land is sick, and when Mother Earth is sick, people are sick: *“it [climate change] makes the land ill and us ill.”* Commonly, health impacts were described as mediated via impacts to the land and Mother Earth:

*“... so it devastates the land and yeah, it’s affecting us physically, and for sure the children and the next generations are going to be affected.”* (Knowledge holder – respect your mother)

It must be emphasized here that Anishinaabe epistemologies understand humans as part of the natural world, and kin to other creatures such that human health and the health of Mother Earth are inseparable (Big-Canoe and Richmond, 2014). Consequently, human health impacts are in many ways implicit when discussing impacts of climate change and ongoing degradation of the land. This is succinctly exemplified in the following quote:

*“[t]here’s going to be less and less of the goodness of the land.”* (Knowledge holder - caring)

Knowledge holders also shared concerns about specific health impacts including Lyme disease, cancer (often associated with pollution and resource extraction specifically), infectious illness, air pollution, food insecurity, and water quality issues. These specific health-related concerns are consistent with scholarly literature identifying climate-sensitive health risks (Howard and Huston, 2019; Watts et al., 2018). Similar climate-sensitive health outcomes have also been identified as concerns in research with Indigenous communities globally and within the lands we now called Canada (Middleton et al., 2020a, 2020b).

Additionally, when discussing connections between climate change and health, knowledge holders described diverse forms of loss. Research with other Indigenous communities across the lands we now call Canada and globally has highlighted loss as a key pathway through which health impacts emerge (Johnson et al., 2021; Middleton et al., 2020a). Consistent with this body of research, Fort William First Nation knowledge holders spoke to loss of traditional medicines and foods due to climate change, loss of livelihoods, loss of flora and fauna, and loss of connectedness to the land specifically. It is noteworthy that many knowledge holders shared the experience of losing blueberry patches, a culturally significant traditional food, associated with resource extractive activities, pollution, and exacerbated by our changing climate.

Descriptions of climate change generally, and the discussions of health impacts specifically, also highlight concerning mental, emotional, and spiritual health impacts in the community. Climate change is clearly exacerbating the mental, emotional, and spiritual health impacts caused by land dispossession and colonization (Brown et al., 2012; Johnson et al., 2021; Middleton et al., 2020a; Tobias and

Richmond, 2014). The following quotes illustrate the diverse ways in which climate change, and the associated changes to the land, are impacting mental, emotional and spiritual health in Fort William First Nation:

*“I believe that because we’re messing with Mother Earth and it does have a certain effect, there’s more mental illness, you know.”* (Knowledge holder - respect)

*“So, my spiritual health - it affects me because when it throws things off. It makes it harder for me to connect to my spiritual side and connecting to the land. And for mental health, worrying about what’s to come in the future and not knowing, but just the fear of not knowing, that really affects it in a harsh manner, because then that’s something that keeps you up at night.”* (Knowledge holder - prosper)

These quotes are also illustrative of experiences of ecological grief (Cunsolo et al., 2020; Cunsolo and Ellis, 2018) and solastalgia (Albrecht, 2005; Galway et al., 2019); two related phenomena increasingly described in the literature on mental, emotional, and spiritual health impacts of climatic and environmental change. Solastalgia is understood as “the distress caused by the unwelcome transformation of cherished landscapes resulting in cumulative mental, emotional, and spiritual health impacts” (Galway et al., 2019, p. 11). Informed by community-engaged research with Inuit, Cunsolo and Ellis (2018) describe ecological grief as “the grief felt in relation to experienced or anticipated ecological losses, including the loss of species, ecosystems, and meaningful landscapes due to acute or chronic environmental change” (p.275). It is important to articulate that none of the knowledge holders used the terms ‘solastalgia’ or ‘ecological grief’, rather, the interview data illustrate alignment with an emerging understanding of these concepts on scholarly work. Strong ties to the land in terms of culture, identity, affect, and spirit among the knowledge holders that participated in our interviews may lead to a heightened susceptibility to experiencing solastalgia and ecological grief as a result of climate change (Galway et al., 2019).

The descriptions of connections linking climate change, land, and health also emphasize that the land, and relationships with the land, provide all that is “needed to live a life of good health, including access to medicines, food, water, clean air, and spiritual connections” (Stelkia et al., 2021). Therefore, this theme also highlights an important pathway for healing and for protecting and promoting the health of Fort William First Nation community members in a changing climate. Protecting lands and restoring and responding to climate change in ways that foster relationships with the land offers many co-benefits for health and healing (MacDonald, 2015; Richards et al., 2019; Watts et al., 2015). Thinking about climate change, and using climate action as an opportunity to promote health and healing is exemplified in the following quote:

*“I know that there’s a lot of gloom and doom scenarios about the future and how we don’t have this and how we don’t have that, but maybe that’s a good thing because it gives us an opportunity to um, explore these other areas of how we can arrive at a new ah, concept of healing and wellness in our communities.”* (Knowledge holder - prophecy)

### 3.4. Theme 4: Youth and future generations

A key theme emerging from conversations with knowledge holders was the importance of youth and future generations; this was something that all knowledge holders spoke to in one way or another. When asked at the outset of the interviews to “tell me a bit about yourself”, nearly all knowledge holders began by speaking about their relationships with their children/grandchildren and/or their role as parents/grandparents: “So, I am a young, Anishinabek mom”, one knowledge holder shared at the outset of our interview. Conversations frequently circled back to youth and future generations when discussing the impacts of

climate change and how to address climate change in ways that could protect and promote health. These discussions illustrate significant fear and worry for children, grandchildren, and future generations. For example:

*"I kind of feel that my grandchildren and my great-grandchildren, future generations, I don't know what they're going to survive, what's going to happen down the road. Because at the rate climate change is happen and it seems to be getting worse."* (Knowledge holder – learn traditional ways)

*"Climate change, it just means I see everything going down to nothing. The bush, the air, it's not like, we're not going to get these berries back, my grandchildren are going to be missing so much out on what we had. You could go and pick and be full from the bush and now ... like, it's just so – so wrong"* (Knowledge holder - hope)

Many knowledge holders shared that an important part of their role in the community was to impart youth and future generations with teachings and to inspire a relationship with, and care for, the land and to address climate change in ways that promote healthy lands and healthy people. For example:

*"I'm worried about the changes just because of the generations to come. I think they have a very hard journey that they're going to be experiencing, but I also think if they are prepared, and by prepared I mean if they have our knowledge of our 7 grandfather teachings, the knowledge of Mother Earth, the knowledge of respect those traditional, cultural knowledge that can move forward in a good way to help make those changes happen because they'll care about what's happening ... I think there needs to be a shift - and I can see it happening. I can see it happening in the little pockets of ... agencies and people, and ceremonies and stuff of people coming to mindfulness more of honoring Mother Earth, honoring yourself, honoring each other. And just as we learn we need to educate though, educate our youth. Because our youth are the ones that are going to need to be prepared."* (Knowledge holder – respect your mother)

We also asked a set of questions about the kinds of activities that could be taken in response to climate change and to protect and promote health; youth and intergenerational relationships featured heavily in these conversations as well. As one knowledge holder stated simply when discussing specific actions to protect physical, mental, emotional, and spiritual health in the context of climate change: *"Elders need to talk to the younger ones."* The importance of fostering intergenerational relationships was described by one knowledge holder in the following way:

*"Because the older teachings tell us there's going to be a period when the old ones who are leaving this world are going to stand up with their fists raised and when they do that then the real change will start to come. And so, we need to see young people and old people standing up with their fists raised, that's an action. And so that's kind of what I see as what has to happen."* (Knowledge holder – Minobihadizewin - plant good seeds)

The emergence of youth and future generations as a theme when exploring the links between climate change, land, and health is perhaps not surprising given the centrality of future generations and the relationships between Elders and youth in Anishinaabe culture (Clarkson et al., 1992; Loew, 2014). The philosophy of looking back and looking forward seven generations, for example, is central to Anishinaabe culture and decision-making processes.

Interviews also illustrate that youth provide a sense of hope to the knowledge holders that participated in this project. One knowledge holder shared this sense of hope when reflecting on climate change and future generations in the following way: *"I'm very hopeful that things are going to eventually even themselves out and that Native people, or Aboriginal people, are going to get back to living the way we once did."* (Knowledge holder - hopefulness).

Over the last decade, climate change and health scholarship has increasingly recognized youth voices as "necessary voices" with regards to experiences, observations, and perceptions about climatic and environmental change and priorities for climate action (MacDonald, 2015; MacDonald et al., 2013; MacKay et al., 2020). This certainly emerged from our interviews. Additional research with Indigenous youth and young adults, drawing on strength-based and land-based approaches, is called for and will be a focus for Fort William First Nation moving forward.

### 3.5. Theme 5: (Re-)connecting with land and culture

The final theme was connecting with land and culture, which was often described by knowledge holders as re-connecting with land and culture, returning to "traditional ways" for example. One Elder shared this idea as *"get back into our Native way ... what our Elders taught us"*, other knowledge holders as returning to the *"Anishinaabe way"* or *"a good life"*. Many knowledge holders described specific ways that Fort William First Nation community members can and should connect and re-connect with land and culture, including cultural gatherings, powwows (a sacred social gathering, with ceremonial aspects, that is widespread among First Nations communities), retreats, using traditional healing and medicines, ceremonies, and teachings. This theme - the importance of connection or re-connecting with the land and culture - captures several interconnected ideas: that connectedness and reciprocity are central to Indigenous life and values, that we (collectively, both Indigenous Peoples and settlers) must (re-)learn to honour and give back to Mother Earth, that the land speaks to and teaches us, and that Elders are valuable stewards of culture and land-based knowledge. Together, these ideas point to opportunities and pathways for responding to and addressing climate change in ways that ultimately protect and promote health now and across generations.

Like the Fort William First Nation knowledge holders interviewed during this project, Indigenous Peoples across Turtle Island (and beyond) are continuing to practice their ways and finding pathways to re-connection in the face of environmental dispossession, colonization and forced assimilation (Mashford-Pringle and Stewart, 2019). Because Indigenous languages, stories, and spirituality are rooted in the land, this re-connection has been described as an element of environmental repossession (Mikraszewicz and Richmond, 2019) or "the social, economic and cultural processes Indigenous Peoples are engaging in to reconnect with their traditional lands and territories and asserting their rights as Indigenous People to improve health and well-being" (p. 2).

This connectedness is central to Indigenous well-being and world-views as is the importance of reciprocity in relationships (Ullrich, 2019). Not surprisingly then, interviews with knowledge holders emphasized the importance of giving back to and honoring Mother Earth, with reference to settlers and Fort William First Nation community members alike. The need to give back to, honor, and respect Mother Earth frequently emerged when knowledge holders were discussing opportunities for addressing and responding to climate change in ways that could protect and promote health.

Finally, discussions about (re-)connecting with land and culture included the importance of both Elders and the land as teachers. Some knowledge holders, recognizing the land as a teacher, theorized that climate change could be a message from Mother Earth, a message calling for action and change. To hear, see, and feel this message from Mother Earth, one must have a strong connection with the land:

*"I think Mother Earth is trying to teach us something, but we're not listening. We're not listening and so, it's affecting [us] – it's all over the world."* (Knowledge holder - prosper)

*"I think the climate is – basically, crying for help and it's giving us little clues and if we're blind enough to not see them, then we're not really one*



with our land anymore.” (Knowledge holder – *heal yourself, heal the land*)

Elders serve as leaders and mentors within Indigenous communities and hold specific land-based knowledge (Mikraszewicz and Richmond, 2019). They can remind youth (and others) to “know who they are and where they come from” (Ulrich, 2019, p. 126). As one knowledge holder recommended:

“... if you want the answers that you’re looking for, you should talk to the Elders, because they lived it, and they will give you the answers because they watch the land and the – all of it, their whole lives. That’s what they base their lives on.” (Knowledge holder - *balance*)

### 3.6. Wholistic theme: All our Relations

Our analyses of Fort William First Nation knowledge holder interviews also revealed a wholistic theme (referred to as a global theme in the scholarly literature applying thematic network analysis, but we use wholistic as a more appropriate construct here). A wholistic theme reflects what the data “as a whole are about within the context of a given analysis” and are both a summary and synthesizing interpretation of the data (Attride-Stirling, 2001, p. 389). In this work, ‘All our Relations’ emerged as the wholistic theme, as a thread that weaves together and connects the themes described and discussed above, while emphasizing the centrality of interconnectedness, relationships, reciprocity, and relationality regarding climate, land, and health from the perspective of Fort William First Nation knowledge holders. ‘All our Relations’ is also central to Indigenous worldviews, values, customs, and protocols that maintain and honor relationships and relationality broadly (Greenwood and Lindsay, 2019). King (1990) writes:

[“All my Relations” is] the English equivalent of a phrase familiar to most Native peoples of North America ... “All my relations” is at first a reminder of who we are and of our relationship with both our family and our relatives. It also reminds us of the extended relationship we share with all human beings. But the relationships that Native people see go further, the web of kinship to animals, to the birds, to the fish, to the plants, to all the animate and inanimate forms that can be seen or imagined.”

We have opted to use all *our* relations rather than all *my* relations as our wholistic theme to also capture the important relationship-building that we have supported throughout the Climate Change & Health in Fort William First Nation project and also to orient our future work with which will continue to engage with the core themes that emerged here, with a focus on intergenerational knowledge sharing and relationship building.

Our findings emphasize that interconnectedness, relationships, reciprocity, and relationality inform how climate change is experienced and understood generally and in relation to health specifically. Moreover, we argue that interconnectedness, relationships, reciprocity, and relationality should inform how we respond to and address climate change in order to protect and promote health (Golden et al., 2015; Greenwood and Lindsay, 2019). In other words, inspired by the experiences and wisdom of Fort William First Nation knowledge holders alongside Indigenous ways of knowing and doing, we (individually and collectively) are called upon to understand and address climate change in ways that are grounded in an understanding of all our relations. Although Indigenous peoples and communities “have long recognized the importance of their knowledge systems for managing change” (Petzold et al., 2020, p. 2), the Intergovernmental Panel on Climate Change has only recently acknowledged the value of Indigenous worldviews, knowledges, and communities in our collective efforts to address and respond to climate change (e.g. (Abram et al., 2019)).

In reflecting on the philosophy of ‘All our Relations’ at the end of our research process, Esquega, co-author and community research lead

rooted in Fort William First Nation land and history, shared the following summative thoughts and story:

All our relations can be found in the land as the protection to maintain balance and health, as it is in the connection to our home and hearts. This is the essence of what all our relations mean. It is also who we are as a Nation and our relationships to ourselves, our family, our relatives (past and future), and each other. Fort William First Nation is home to the Ojibway spirit and all members of the human family. During a time of great need, the city of Thunder Bay endured a disease that plagued the city. Our community and lands became a beacon of hope, as the main water source. The water came from atop Anemki-waucheau, which flowed from Fort William First Nation lands. This is the heart of what all our relations means to the resilient people of Fort William First Nation as they provided the city’s water and saved lives during a time of crisis. It is a beautiful and timely reminder of the human spirit reflected in the care and respect extended towards all our relations in times of crisis and need.

### 4. Concluding thoughts and offerings

We want to share three key lessons as offerings to others engaging in climate change-related research and action, with particular relevance for those working with Indigenous Peoples and communities. First, through the wisdom, stories, and lived experiences shared by Fort William First Nation knowledge holders, this research has highlighted the importance of centering land when exploring the links between climate change and health. In the words of one knowledge holder, “*land is everything, land is us*”. Our findings illustrate that land and connections to land are an essential aspect of understanding how climate change is and will impact health while also orienting pathways for protecting and promoting health and healing in the context of the climate crisis. This aligns with calls from Johnson et al. (2021), who advocate for “a new research agenda that places Indigenous peoples’ perspectives on health and wellbeing at the heart of discussions on climate change” (p. 485). Centering the land, and rooting climate and health research and action in land and connections to the land, is relevant across Turtle Island and globally. Second, we emphasize the value of both the Two-Eyed Seeing approach and the Medicine Wheel in guiding climate change and health research with Indigenous Peoples and communities. A Two-Eyed Seeing approach was used to guide the project as a whole, to support relationship-building and co-learning, and to inform the analysis of interview data. Echoing Iwama et al. (2009, p. 3) this approach enabled a “wider, deeper, and more generative field of view” with respect to data analysis. Moreover, as we worked together to understand and find meaning in our data through ‘two-eyes’, holding the views of both Indigenous and Western knowledge simultaneously, we also learned more about each other and how to learn and work together with respect. Like others (Moorman et al., 2021; Peltier, 2018), we found that using a Two-Eyed Seeing approach reduced binary and hierarchical thinking, fostered respectful relationships, and created a safe space for learning and working together. We found that the Medicine Wheel helped us to design the overall project, and the interview guide specifically, in a more wholistic and balanced way. The third and final lesson we share is the importance and value of explicitly rooting climate change and health research and action in an understanding that we are all relations, and seeking to re-connect and promote relationships and relationality in our efforts to both understand and address climate change.

### Author statement

Galway and Esquega conceptualized the “Climate Change & Health in Fort William First Nation” project and designed the specific study objectives, data collection, and data analysis processes reported herein. Esquega conducted the interviews. Galway and Esquega co-analyzed and interpreted the interview data. Galway and Esquega co-wrote the manuscript. Jones-Casey assisted with data analysis and writing and

review of the final manuscript.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2022.114700>.

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